



# CLEAN COAL TODAY

A NEWSLETTER ABOUT INNOVATIVE TECHNOLOGIES FOR COAL UTILIZATION

## INDEX OF ARTICLES

*Clean Coal Today* is a quarterly newsletter of the U.S. Department of Energy (DOE) Office of Clean Coal (OCC). Its primary objective is to inform OCC stakeholders of the activities and status of a wide range of OCC R&D activities. *Clean Coal Today* features news of the latest coal-related R&D advances, and reports on timely policy and environmental topics. Progress of various demonstration programs is reported, including the Clean Coal Power Initiative (CCPI), Power Plant Improvement Initiative (PPII), and the original Clean Coal Technology (CCT) Demonstration Program. A News Bytes column appears in every issue, and periodic columns include R&D Milestones achieved by in-house and contractor researchers, International Initiatives, State and Regional activities, and occasional guest articles.

*Clean Coal Today* is distributed to some 3,500 domestic and international readers, and also may be found on the Internet as part of the Clean Coal Technology Compendium ([www.netl.doe.gov/technologies/coalpower/cctc/newsletter/newsletter.html](http://www.netl.doe.gov/technologies/coalpower/cctc/newsletter/newsletter.html)). The newsletter reaches a broad customer/stakeholder audience including users and vendors of clean coal technologies, the coal R&D community, regulators and public policy makers, environmental organizations, financiers, exporters, public interest groups, and the public in general.

Key actions reported to readers by *Clean Coal Today* during the past year included an announcement of the cooperative agreement signed with the FutureGen Industrial Alliance Inc., the holding of the first annual carbon sequestration regional partnership meeting, conclusion of a new fossil energy (FE) protocol between the United States and China, and holding of the 2005 Clean Coal and Power Conference. The Carbon Sequestration Leadership Forum held its annual meeting in Berlin, Germany, making significant strides toward enhancing stakeholder involvement, increasing participation among developing countries, and expanding project endorsements.

Beginning with Issue No. 1, published in 1990, this *Index of Articles* for issues 1-66 of *Clean Coal Today* will assist readers in identifying articles of interest. Pages 2-9 present articles on CCT, CCPI, and PPII projects organized by technology category. Pages 10-23 present all other articles arranged by subject area.

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- Five New Clean Coal Projects: Demonstration of Clean Coal Diesel Technology at Easton Utilities **Spring 1993: 3**
- Coal-Fueled Diesel Demonstration Project Re-Sited to Alaska **Fall 1996: 14**
- Coal-Fueled Diesel Engine Demonstration Given Go-Ahead for Alaska **Winter 1997: 1**
- Coal-Fueled Diesel on Schedule for January 1999 Delivery to Fairbanks, Alaska **Winter 1998: 6**

**Healy Clean Coal Project***Alaska Industrial Development and Export Authority*

- Healy Celebrates a Successful Groundbreaking **Summer 1995: 1**
- Progress and Achievements **Fall 1995: 4**
- Healy Clean Coal Project Provides Power & Environmental Benefits **Fall 1998: 1**

**Warren Station Externally Fired Combined-Cycle Demonstration Project***Pennsylvania Electric Company*

- Five New Clean Coal Projects: Warren Station EFCC Demonstration Project **Spring 1993: 3**

**– Advanced Electric Power Generation – Fluidized-Bed Combustion –****ACFB Demonstration Project***JEA*

- Large-Scale Atmospheric Circulating Fluidized-Bed Combustion Technology **Winter 1997: 2**
- JEA's Large-Scale CFB Demonstration Project Near Construction Peak **Spring 2001: 1**
- Powerplant Award, Multiple Visits Precede JEA Dedication **Fall/Winter 2002: 1**
- JEA Successfully Completes World's Largest CFB Demonstration **Fall 2005: 4**

**Circulating Fluidized-Bed (CFB) Project***Colorado-Ute Electric Association*

- Colorado Fluid Bed Project Yields Both Power and Data **Winter 1990: 1**

**McIntosh Unit 4A PCFB Demonstration Project***Lakeland Electric*

- Two PCFB Projects Re-Sited to Lakeland, Florida **Winter 1996: 3**

**Four Rivers Energy Modernization Project****[Novated to McIntosh Unit 4A PCFB Demonstration Project]***Four Rivers Energy Partners, L.P.*

- Five New Clean Coal Projects: Calvert City Advanced Energy Project **Spring 1993: 2**
- Two PCFB Projects Re-Sited to Lakeland, Florida **Winter 1996: 3**

**McIntosh Unit 4B Topped PCFB Demonstration Project***Lakeland Electric*

- Two PCFB Projects Re-Sited to Lakeland, Florida **Winter 1996: 3**

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**Nucla CFB Demonstration Project***Tri-State Generation and Transmission Association, Inc.*

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| • Progress and Achievements | Fall 1995: 4 |
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**PCFB Demonstration Project****[Novated to McIntosh Unit 4B Topped PCFB Demonstration Project]***DMEC-1 Limited Partnership*

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| • Des Moines, Iowa Greets New Clean Coal Plant    | Fall 1991: 5   |
| • Two PCFB Projects Re-Sited to Lakeland, Florida | Winter 1996: 3 |

**Tidd PFBC Demonstration Project***The Ohio Power Company*

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| • Tidd Plant Produces Power: Operations Planned Early 1991                       | Winter 1990: 5 |
| • Tidd Receives 1991 Power Plant Award   | Spring 1991: 7 |
| • Tidd Plant Resumes Operation   | Winter 1991: 3 |
| • Tidd Plant Sets New Technical Operations and Environmental Performance Records | Summer 1992: 4 |
| • Tidd Extended Runs Verify Design Basis   | Fall 1992: 5   |
| • Tidd Sets Mark with Continuous 45-Day Run                                      | Summer 1994: 4 |
| • Tidd Concludes Four-Year PFBC Test Program                                     | Summer 1995: 5 |
| • Progress and Achievements  | Fall 1995: 4   |

**– Advanced Electric Power Generation – Integrated Gasification Combined-Cycle –****Combustion Engineering IGCC Repowering Project***ABB Combustion Engineering, Inc.*

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| • Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:<br>Six Major Projects in DOE's CCT Program | Spring 1992: 1 |
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**Kentucky Pioneer Energy IGCC Demonstration Project (formerly Clean Energy Demonstration Project)***Kentucky Pioneer Energy, LLC*

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| • Five New Clean Coal Projects: Camden Clean Energy Project | Spring 1993: 2 |
| • Clean Energy Demonstration IGCC Project Progression       | Spring 1999: 1 |
| • Kentucky Pioneer IGCC/Fuel Cell Project Underway          | Spring 2003: 5 |

**Piñon Pine IGCC Power Project***Sierra Pacific Power Company*

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| • Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition   | Fall 1991: 3        |
| • Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle:<br>Six Major Projects in DOE's CCT Program | Spring 1992: 3      |
| • Progress and Achievements   | Fall 1995: 4        |
| • Piñon Pine IGCC Plant Construction on Schedule  | Summer 1996: 1      |
| • Second Generation Coal Gasification Technology: Startup and Operations Phase in Piñon Pine IGCC Project                   | Summer/Fall 1997: 5 |
| • IGCC – A Glimpse Into the Future  | Spring 1998: 1      |

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**Tampa Electric Integrated Gasification Combined-Cycle Project***Tampa Electric Company*

- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle: Six Major Projects in DOE's CCT Program **Spring 1992: 3**
- Florida Project Demonstrates Key Technologies **Spring 1993: 4**
- Tampa Electric's Greenfield IGCC Ready for Demonstration **Winter 1996: 1**
- Two CCT Technologies Win Industry Awards **Summer/Fall 1997: 16**
- IGCC – A Glimpse Into the Future **Spring 1998: 1**

**Toms Creek IGCC Demonstration Project***TAMCO Power Partners*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle: Six Major Projects in DOE's CCT Program **Spring 1992: 3**

**Wabash River Coal Gasification Repowering Project***Wabash River Coal Gasification Repowering Project Joint Venture*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle: Six Major Projects in DOE's CCT Program **Spring 1992: 3**
- Promise of Coal Gasification Power Draws 400 Representatives to Wabash River Site **Summer 1993: 4**
- Wabash River on Schedule for 1995 Startup: Largest U.S. Single Train IGCC Facility **Winter 1993: 4**
- Progress and Achievements **Fall 1995: 4**
- O'Leary Heralds Wabash Startup **Winter 1995: 4**
- Wabash Plant Begins Operating **Spring 1996: 1**
- Wabash Wins Powerplant Award **Spring 1997: 7**
- IGCC – A Glimpse Into the Future **Spring 1998: 1**
- Wabash Completes Fourth Year of Commercial Operation **Spring 2000: 1**

**– Coal Processing for Clean Fuels –****Advanced Coal Conversion Process Demonstration***Western SynCoal LLP*

- Montana Plant to Open New Markets for Plentiful Low-Rank Coals **Fall 1991: 4**
- Birth of a New Industry: SynCoal® Burn Tests Spawn Commercial Studies **Winter 1993: 1**
- Progress and Achievements **Fall 1995: 4**
- Rosebud Recruits Customers for Upgraded Coals **Fall 1999: 8**

**Commercial-Scale Demonstration of the Liquid-Phase Methanol (LPMEOH™) Process***Air Products Liquid Phase Conversion Company, L.P.*

- Advanced Power Generation Future Bright with Coal Gasification-Combined Cycle: Six Major Projects in DOE's CCT Program **Spring 1992: 3**
- Site Chosen for Coal to Methanol Energy Project **Winter 1993: 5**

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- LPMEOH™ Demonstration to Start Up in the Fall **Spring 1996: 10**
- LPMEOH™ Demonstration Produces First Methanol From Coal **Summer/Fall 1997: 1**
- LPMEOH™ Demonstration Project Completes First Year of Operation **Summer 1998: 6**
- LPMEOH™ Project Performs Well During Second Year of Operation **Summer 1999: 1**
- LPMEOH™ Demonstration Project Conducts Product-Use Study **Summer 2000: 1**
- Clean Coal Technology Commercially Producing Methanol from Coal **Summer 2003: 12**

**Cordero Coal Upgrading Demonstration Project***Cordero Mining Company*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**

**Development of the Coal Quality Expert***ABB Combustion Engineering, Inc., and CQ Inc.*

- Clean Coal Project Will Develop Expert Computer Software Program **Winter 1991: 6**
- CQ Inc. Software Tool Eases Utility Decision-Making **Fall 1996: 1**

**ENCOAL® Mild Gasification Project***ENCOAL® Corporation*

- ENCOAL® Mild Gasification Project Breaks Ground in Many Ways **Spring 1991: 6**
- ENCOAL® Project Continues Rapid Pace: Spring 1992 Plant Startup Expected **Winter 1991: 1**
- ENCOAL® Plant Starting Up **Summer 1992: 4**
- ENCOAL® Project Resumes Operation **Winter 1993: 8**
- ENCOAL® Plant Enters Production Mode **Summer 1994: 7**
- Progress and Achievements **Fall 1995: 4**
- ENCOAL® Mild Coal Gasification Project Completes Final Reports **Spring 1998: 5**

**Self-Scrubbing Coal™: An Integrated Approach to Clean Air***Custom Coals International*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- Custom Coals Nears Completion **Summer 1995: 4**
- Progress and Achievements **Fall 1995: 4**
- Materials Technology for Ultra-Supercritical Plants **Spring 2002: 3**

**– Environmental Control Devices – SO<sub>2</sub> Control Technologies –****10-MWe Demonstration of Gas Suspension Absorption***AirPol, Inc.*

- AirPol Plant Runs Smoothly: Early Tests Show High SO<sub>2</sub> Removals **Winter 1992: 1**

**Advanced Flue Gas Desulfurization Demonstration Project***Pure Air on the Lake, L.P.*

- Pure Air Flue Gas Project Construction Well Advanced **Spring 1991: 1**
- Pure Air FGD Scrubber Begins Operations: Indiana Utility Leads Nation in Clean Air Act Compliance **Summer 1992: 5**
- Clean Coal Project Wins Outstanding Achievement Award **Winter 1992: 3**

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- Pure Air Project Helps Hurricane Relief Efforts Winter 1992: 3
- Continued Success with Landmark Pure Air Project Summer 1994: 1
- Progress and Achievements Fall 1995: 4
- Pure Air Project Completed Fall 1996: 8

**Demonstration of Innovative Applications of Technology for the CT-121 FGD Process***Southern Company Services, Inc.*

- Fiberglass Reinforced Plastic Highlights CT-121 “Second Generation” Wet Scrubber Summer 1991: 2
- Outperforming Conventional Systems: CT-121 Advanced Scrubber Moves Ahead at Georgia Site Summer 1993: 1

**Demonstration of the Union Carbide CANSOLV System at the ALCOA Generating Corporation Warrick Power Plant***Union Carbide Chemicals and Plastics Company, Inc.*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition Fall 1991: 3

**LIFAC Sorbent Injection Desulfurization Demonstration Project***LIFAC–North America*

- LIFAC Process Tests Now Underway Winter 1992: 4
- LIFAC Nearing Marketability Spring 1996: 7

**– Environmental Control Devices – NO<sub>x</sub> Control Technologies –****Demonstration of Advanced Combustion Techniques for a Wall-Fired Boiler***Southern Company Services, Inc.*

- Wall-Fired Boiler Low NO<sub>x</sub> Overfire Air Tests Complete Spring 1991: 3
- Georgia Power’s Plant Hammond Previews Clean Air Act’s NO<sub>x</sub> Challenges Winter 1991: 4
- Progress and Achievements Fall 1995: 4
- GNOCIS Software Commercializing Globally Summer/Fall 1997: 3

**Demonstration of Coal Reburning for Cyclone Boiler NO<sub>x</sub> Control***The Babcock & Wilcox Company*

- Cyclone Boiler Coal Reburn Technology Cuts NO<sub>x</sub> by More Than 50 Percent Spring 1992: 6
- Coal Reburn Exceeds Expected NO<sub>x</sub> Reductions: Control Option for High NO<sub>x</sub> Emitting Cyclone Boilers Demonstrated Spring 1993: 6

**Demonstration of Selective Catalytic Reduction Technology for the Control of NO<sub>x</sub> Emissions from High-Sulfur-Coal-Fired Boilers***Southern Company Services, Inc.*

- Catalyst Suppliers Selected in Southern Company’s SCR Project Summer 1991: 7
- SCR Holds Promise for Effective NO<sub>x</sub> Control: CCT Projects Address Higher Costs, Limited U.S. Experience Summer 1992: 2
- SCR Tests Progress at Gulf’s Plant Crist Summer 1993: 7
- Progress and Achievements Fall 1995: 4
- SCR Successes: Catalyst Performance & NO<sub>x</sub> Reduction Fall 1996: 10



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**Evaluation of Gas Reburning and Low-NO<sub>x</sub> Burners on a Wall-Fired Boiler***General Electric Energy and Environmental Research Corporation*

- EER's Gas Reburning: Low-NO<sub>x</sub> Burner Technologies Reducing NO<sub>x</sub> Emissions **Winter 1992: 6**
- EER Completes Three Demonstration Tests (Cherokee Station Unit 3) **Summer 1995: 6**
- Site Tour: Cherokee Station Unit 3 **Fall 1995: 3**
- Two CCT Technologies Win Industry Awards **Summer/Fall 1997: 16**

**Full-Scale Demonstration of Low-NO<sub>x</sub> Cell Burner Retrofit***The Babcock & Wilcox Company*

- B&W Low-NO<sub>x</sub> Cell Burners Fabricated **Spring 1991: 7**
- B&W Low-NO<sub>x</sub> Cell Burner Tests Under Way **Summer 1992: 6**
- Two CCT Projects "Get the Word Out:" Low-NO<sub>x</sub> Cell Burner Project and NOXSO SO<sub>2</sub>/NO<sub>x</sub> Removal Project **Spring 1993: 8**
- Clean Coal Program Marks First Commercial Success with Sale of Low-NO<sub>x</sub> Technology **Summer 1993: 6**

**Micronized Coal Reburning Demonstration for NO<sub>x</sub> Control on a 175-MWe Wall-Fired Unit***New York State Electric and Gas Corp.*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**

**Selective Catalytic Reduction Project (Plant Crist, Pensacola, FL)***Southern Company Services Inc.*

- SCR Holds Promise for Effective NO<sub>x</sub> Control: CCT Projects Address Higher Costs, Limited U.S. Experience **Summer 1992: 1**
- Gulf Power's SCR Test Facility in Operation  
(Defining SCR Catalysts for U.S. High Sulfur Coals) **Spring 1994: 4**

**– Environmental Control Devices – Combined SO<sub>2</sub>/NO<sub>x</sub> Control Technologies –****Commercial Demonstration of the NOXSO SO<sub>2</sub>/NO<sub>x</sub> Removal Flue Gas Cleanup System***NOXSO Corporation*

- Two CCT Projects "Get the Word Out:" Low-NO<sub>x</sub> Cell Burner Project and NOXSO SO<sub>2</sub>/NO<sub>x</sub> Removal Project **Spring 1993: 8**
- Financing and Opt-In Regulations Assist NOXSO **Spring 1996: 5**

**Enhancing the Use of Coals by Gas Reburning and Sorbent Injection***General Electric Energy and Environmental Research Corporation*

- Gas Reburning Tests Begin at Illinois Power Plant: Early Tests Exceed Expectations **Summer 1991: 1**
- Gas Reburning Emerging as Cost-Effective Nitrogen Oxide Reduction Technique **Spring 1992: 4**
- EER Completes Three Demonstration Tests (Hennepin Station Unit 1 and Lakeside Station Unit 7) **Summer 1995: 6**
- Two CCT Technologies Win Industry Awards **Summer/Fall 1997: 16**

**Integrated Dry NO<sub>x</sub>/SO<sub>2</sub> Emissions Control System***Public Service Company of Colorado*

- Second Colorado Project Also Opening: PSCC Tests Integrated NO<sub>x</sub>/SO<sub>2</sub> Emissions Control System **Winter 1992: 7**
- Site Tour: Arapahoe Station Unit 4 **Fall 1995: 3**

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**LIMB Demonstration Project Extension and Coolside Demonstration***The Babcock & Wilcox Company*

- B&W's LIMB Operating; Coolside Tests Complete **Winter 1990: 3**

**Milliken Clean Coal Technology Demonstration Project***New York State Electric & Gas Corporation*

- Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition **Fall 1991: 3**
- Total Environmental and Energy Management: Milliken Project in Final Construction Stage **Summer 1994: 6**
- Progress and Achievements **Fall 1995: 4**
- Milliken Clean Coal Project Under Way **Summer 1996: 4**
- Milliken CCT Demonstration Project Nears Completion **Summer 1999: 5**

**SNOX™ Flue Gas Cleaning Demonstration Project (Formerly Ohio Edison, Niles Station)***ABB Environmental Systems*

- WSA-SNOX™ Offers Multiple Pollutant Capture, Efficiency, Salable By-Products **Fall 1991: 6**
- SNOX™ Demonstration on Line **Winter 1991: 3**
- SCR Holds Promise for Effective NO<sub>x</sub> Control: CCT Projects Address Higher Costs, Limited U.S. Experience (SNOX™) **Summer 1992: 1**

**SO<sub>x</sub>-NO<sub>x</sub>-Rox Box™ Flue Gas Cleanup Demonstration Project***The Babcock & Wilcox Company*

- Success is in the Ceramic Bag: B&W's SO<sub>x</sub>-NO<sub>x</sub>-Rox Box™ Starts Up **Spring 1992: 6**
- SCR Holds Promise for Effective NO<sub>x</sub> Control: CCT Projects Address Higher Costs, Limited U.S. Experience (SNRB) **Summer 1992: 2**
- Progressive Technology Exceeds Expectations **Summer 1993: 3**

**– Industrial Applications –****Advanced Cyclone Combustor with Internal Sulfur, Nitrogen, and Ash Control***Coal Tech Corporation*

- Coal Tech Completes Combustor Operations **Winter 1990: 4**

**Blast Furnace Granulated-Coal Injection System Demonstration Project***Bethlehem Steel Corporation*

- Bethlehem on Schedule for Early 1995 Startup: Blast Furnace Coal Facility in Construction **Spring 1994: 2**
- Progress and Achievements **Fall 1995: 4**
- Cleaner Iron-Making Process in Full-Scale Testing **Summer 1996: 6**
- Bethlehem Steel Successfully Completes Demonstration **Winter 1999: 1**

**Cement Kiln Flue Gas Recovery Scrubber***Passamaquoddy Tribe*

- Passamaquoddy Cement Kiln Project Begins Operations **Spring 1991: 4**
- Success Continued at Cement Kiln Project **Fall 1992: 6**

**Clean Power from Integrated Coal/Ore Reduction (COREX®)***Centerior Energy Corporation*

- Five New Clean Coal Projects: Clean Power from Integrated COREX®-CPICOR™ Process **Spring 1993: 3**
- CPICOR™ Project Awarded **Winter 1996: 6**



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**Demonstration of Pulse Combustion in an Application for Steam Gasification of Coal***ThermoChem, Inc.*

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| • Nine New Clean Coal Technology Projects Selected in Fourth Round of Competition | <b>Fall 1991: 3</b>    |
| • ThermoChem, Inc. CCT-IV Project Revised   | <b>Winter 1998: 10</b> |

**Innovative Coke Oven Gas Cleaning System for Retrofit Applications***Bethlehem Steel Corporation*

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| • Bethlehem Steel's Innovative Cleanup System Nears Completion at Sparrows Point | <b>Summer 1991: 4</b> |
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**— CLEAN COAL POWER INITIATIVE —**

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| • New Clean Coal Efforts Gain Momentum                                   | <b>Summer 2001: 1</b>       |
| • Progress Under Two Clean Coal Funding Vehicles                         | <b>Winter 2001: 7</b>       |
| • DOE Issued Solicitation for Clean Coal Power Initiative                | <b>Spring 2002: 1</b>       |
| • NETL Holds Clean Coal Power Initiative Preaward Meeting                | <b>Spring 2003: 4</b>       |
| • Clean Coal Power Initiative Workshop                                   | <b>Fall/Winter 2003: 15</b> |
| • Two CCPI Projects Move Forward   | <b>Summer 2004: 6</b>       |
| • New Projects Join CCPI   | <b>Spring 2005: 6</b>       |
| • Ribbon Cutting Milestone for the CCPI Lignite Fuel Enhancement Project | <b>Fall 2005: 13</b>        |

**— POWER PLANT IMPROVEMENT INITIATIVE —**

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| • Congress Enacts New Power Plant Improvement Initiative | <b>Winter 2000: 1</b>      |
| • Progress Under Two Clean Coal Funding Vehicles         | <b>Winter 2001: 7</b>      |
| • First PPII Projects Successfully Negotiated            | <b>Fall/Winter 2002: 4</b> |
| • Two New PPII Projects Move Forward                     | <b>Summer 2003: 8</b>      |

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## — CARBON SEQUESTRATION LEADERSHIP FORUM —

• First National Conference on Carbon Sequestration to be Held	Winter 2000: 8
• First National Conference on Carbon Sequestration	Fall 2001: 3
• DOE and State Department Hold First Sequestration Forum	Summer 2003: 1
• U.S. DOE is Carbon Sequestration Leadership Forum Secretariat	Fall/Winter 2003: 10
• CSLF Meets in Rome	Spring 2004: 8
• DOE-NETL Chair Third Carbon Capture and Sequestration Conference	Summer 2004: 1
• Sequestration Leadership Forum Meets in Australia	Winter 2004: 1
• CSLF Expands Participation, Meets in Berlin	Winter 2005: 8

## — CLEAN COAL TECHNOLOGY PROGRAM ACTIVITIES —

### – CCT Conferences –

• Notable First Annual Clean Coal Conference: Technology Developers Linked with Wide Range of Users	Fall 1992: 1
• Second Annual CCT Conference Examines Technology Markets; CCT Markets Session Examines Market Opportunities at Home and Abroad; Deployment/Outreach Panel Addresses Opportunities for Commercial Success	Fall 1993: 1, 5, 6
• Third Annual CCT Conference Highlights Program Successes; CCT International/Domestic Markets Explored by International and Industry Analysts	Winter 1994: 1, 6
• The Global Opportunity: A Message from Pat Godley, Assistant Secretary for Fossil Energy (Special Fourth Annual CCT Conference Edition)	Fall 1995: 1
• Welcome — From Our Sponsors (Special Fourth Annual CCT Conference Edition)	Fall 1995: 1
• A Message from the Editor (Fourth Annual CCT Conference)	Winter 1995: 3
• CCT Conference Preview (Fifth Annual CCT Conference)	Winter 1996: 12
• Fifth Annual CCT Conference Addresses CCT's Future	Spring 1997: 1
• Thanks to CCT Conference Sponsors (Fifth Annual CCT Conference)	Spring 1997: 3
• Sixth Clean Coal Technology Conference Preview	Spring 1998: 12
• CCTs Technical Progress Update (Sixth Annual CCT Conference)	Summer 1998: 4
• Seventh Clean Coal Technology Conference Preview	Summer 1999: 15
• DOE Clean Coal and Power Conference	Fall 2001: 2
• Clean Coal and Power Conference Explores Coal's Future	Winter 2001: 1
• DOE and U.S.-China Conferences Focus on Coal	Fall/Winter 2003: 1
• Clean Coal Conference Highlights Technology Promise	Winter 2005: 1

### – CCT Program Direction –

• Fourth PON Release Near	Winter 1990: 5
• Comprehensive Reports to Congress for Clean Coal Technology Projects	Winter 1990: 11

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• Round IV Update		Spring/Summer 1991: 7; Winter 1991: 3; Summer 1992: 7; Fall 1992: 5
• Round V Update		Fall 1991: 3; Summer 1992: 4; Winter 1992: 5
• Award-Winning Clean Coal Technology Demonstration Projects		Spring 1996: 3
• Completed Projects — Participants' Final Reports		Spring 1998: 11; Summer 1998: 16
• Completed CCT Projects Summarized in New Publications		Fall 1999: 5
• Timeline of Active CCT Projects		Summer 2000: 15
• New Clean Coal Efforts Gain Momentum		Summer 2001: 1
• Progress Under Two Clean Coal Funding Vehicles		Winter 2001: 7
<b>– CCT Program Outreach –</b>		
• Debut of <i>Clean Coal Today</i>		Winter 1990: 1
• Clean Coal Outreach		Spring 1991: 1; Spring 1996: 18
• Exhibits Accent Reducing Greenhouse Gas Emissions (Clean Coal Celebrates Earth Day 1994)		Spring 1994: 1
• DOE Launches New Clean Coal Technology Web site (CCT Compendium)		Spring 1998: 9; Fall 1999: 13
<b>– CCT Successes and Commercialization –</b>		
• Introducing the Global CCT Opportunity (Fourth Annual CCT Conference)		Winter 1995: 1
• O'Leary Heralds Wabash Startup (Fourth Annual CCT Conference)		Winter 1995: 1
• CCT Commercialization Challenges (Fourth Annual CCT Conference)		Winter 1995: 4
• International CCT Deployment Needs Strong U.S. Support (Fourth Annual CCT Conference)		Winter 1995: 5
• Improving the "Enabling Environment" for CCTs (Fourth Annual CCT Conference)		Winter 1995: 8
• Expanding the International Market (Fourth Annual CCT Conference)		Winter 1995: 12
• O'Leary Heralds Bright Future for Coal		Fall 1996: 12
• Commercialization Updates/Briefs		Fall/Winter 1996: 3; Spring 1997: 6; Summer/Fall/Winter 1997: 3
• Opportunities for IGCC		Winter 1996: 9
• DOE/Industry Seminars Identify CCT Opportunities and Challenges		Winter 1997: 4
• Challenges and Opportunities for Clean Coal Technology (Sixth Annual CCT Conference)		Summer 1998: 1
• Carbon Offsets Create Business Opportunities for CCTs (Sixth Annual CCT Conference)		Summer 1998: 10
• CCT Program Successes		Summer 1999: 11
• Clean Coal Technology in the Next Millennium (Seventh Annual CCT Conference)		Fall 1999: 3
• Successful Demonstration of SNCR at AEP's 600-MWe Cardinal Plant		Summer 2000: 6
• Powerplant Award, Multiple Visits Precede JEA Dedication		Fall/Winter 2002: 1

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## — COMPUTATIONAL SCIENCE (3-D VISUALIZATION, SUPERCOMPUTING, MODELING, ETC.) —

• Virtual Energy Plants of the Future	Summer 2001: 3
• NETL Hosts Virtual Simulation Workshop	Winter 2001: 10
• Revolutionary Advanced Energy System Modeling	Fall/Winter 2003: 13
• Computer Code Can Help Build Better Fluidized Beds	Spring 2004: 12
• Virtual Reality to Improve New Power Plant Designs, Lower Costs	Summer 2004: 4
• Computational Methods for Hydrogen Membranes	Spring 2005: 8
• Technology Development through High-Performance Computing	Summer 2005: 10

## — CONFERENCES AND WORKSHOPS —

• International CCT Finance Seminar	Fall 1996: 7
• Clean Coal Technology Workshop in India	Winter 1996: 5
• DOE Sponsors CCT and Coal Utilization Workshop	Winter 1997: 9
• Ukraine Conference Highlights Financial Recovery, Obstacles to Power Sector Development	Summer 1998: 12
• Advanced Coal-Based Power and Environmental Systems '98 Conference	Fall 1998: 7
• Pittsburgh Coal Conference – Panel Highlights Asia Energy Picture	Winter 1998: 5
• First Annual Meeting of U.S.–China Energy and Environmental Technology Center	Summer 1999: 9
• U.S./Japan Workshop Highlights R&D Cooperation	Summer 1999: 9
• U.S./Turkey Conference Highlights Fossil Energy	Fall 1999: 6
• Carbon Sequestration Workshop Focuses on R&D	Winter 1999: 8
• Kyoto Update: COP 5	Winter 1999: 9
• CoalTech '99 Conference in Jakarta, Indonesia	Winter 1999: 12
• DOE Participates in International Conference in India	Spring 2000: 10
• FE Hosts Annual NO <sub>x</sub> Specialty Conferences	Fall 2000: 6
• Two Major Conferences in China Under DOE–MOST Protocol	Spring 2001: 8
• Gasification Technologies Workshop for Environmental Regulators	Summer 2001: 8
• NETL Hosts Sensors and Controls Workshop	Summer 2001: 9
• NETL Hosts Virtual Simulation Workshop	Winter 2001: 10
• Combustion Workshop Solicits Stakeholder Input	Spring 2002: 11
• FE Hosts Specialty Conferences	Summer 2002: 4
• Clean Coal Forum	Summer 2002: 6
• NETL Conference on PM <sub>2.5</sub> and Electric Power	Summer 2002: 9
• Mercury/PM <sub>2.5</sub> Conference Addresses Regulatory and Technology Issues	Fall/Winter 2002: 13
• Clean Coal Power Initiative Workshop	Fall/Winter 2003: 15

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• FE Hosts Speciality Conferences		Fall/Winter 2003: 16
• 30th Annual Clearwater Coal Conference		Summer 2005: 3
• Unburned Carbon Conference Joins World of Coal Ash		Summer 2005: 13

## — ENVIRONMENTAL PROGRAMS —

### – Carbon Sequestration –

• Global CO <sub>2</sub> Control Agenda		Winter 1997: 5
• CO <sub>2</sub> Sequestration to Reduce Greenhouse Gas		Spring 1998: 3
• Carbon Offsets Create Business Opportunities for CCTs		Summer 1998: 10
• Novel Concepts Awards		Summer 1998: 14
• Geological CO <sub>2</sub> Sequestration to Benefit Coal's Future		Spring 1999: 12
• Energy Secretary Issues Carbon Sequestration Challenge (Seventh Annual CCT Conference)		Fall 1999: 1
• Carbon Sequestration Workshop Focuses on R&D		Winter 1999: 8
• Kyoto Update: COP 5		Winter 1999: 9
• Carbon Products Consortium Reviews Accomplishments and Future Research (guest article)		Winter 2000: 4
• Fossil Energy's CO <sub>2</sub> Sequestration Program Gains Momentum		Winter 2000: 6
• First National Conference on Carbon Sequestration to be Held		Winter 2000: 8
• CO <sub>2</sub> Capture RD&D Test Network Created		Winter 2000: 9
• International CO <sub>2</sub> Ocean Sequestration Field Experiment: 2000 Oceanographic Research Cruise		Winter 2000: 10
• First National Conference on Carbon Sequestration		Fall 2001: 3
• TVA Mined Land Becomes Carbon Sink		Fall 2001: 8
• New APEC Report on CO <sub>2</sub> Reduction Options		Winter 2001: 8
• Coalbed Methane — Enhancing Production and Sequestering CO <sub>2</sub>		Summer 2002: 7
• Brine Aquifers for CO <sub>2</sub> Sequestration		Summer 2002: 10
• Weyburn Demonstrating New CO <sub>2</sub> Storage, Monitoring, and Verification Techniques		Fall/Winter 2002: 12
• DOE Announces New Hydrogen-Sequestration Efforts		Spring 2003: 2
• DOE Hosts First Meeting of Regional Sequestration Partnerships		Fall/Winter 2003: 4
• Seven Regional Carbon Sequestration Partnerships		Fall/Winter 2003: 5
• Carbon Sequestration Program Explores Options		Spring 2004: 6
• Sequestration Conference Reports on International CO <sub>2</sub> Capture Project		Summer 2004: 3
• FE-European Commission Meet to Discuss CO <sub>2</sub> Cooperation		Summer 2004: 9
• Hydrate Process to Capture and Sequester CO <sub>2</sub> from Coal Syngas		Fall 2004: 3
• CO <sub>2</sub> Sequestration Monitoring in Norway's North Sea		Fall 2004: 12
• Advances in CO <sub>2</sub> Capture Via Oxygen-Based Combustion Processes		Winter 2004: 10
• First Annual Carbon Sequestration Regional Partnership Meeting		Spring 2005: 1
• Field Tests Validate Geosequestration		Summer 2005: 8

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• U.S. and Canada Cooperate on Oxy-Combustion		Fall 2005: 9
• Appalachian Mine Land Restoration Demonstrates Sequestration Benefits		Winter 2005: 7
<b>– Other Environmental Programs (SO<sub>2</sub>, NO<sub>x</sub>, Mercury, PM<sub>2.5</sub>, Water) –</b>		
• Clean Coal Projects Join Integrated Effort to Obtain Toxic Air Pollutant Data		Winter 1991: 7
• Update — Clean Coal Air Toxics Testing Programs		Winter 1993: 3
• Air Toxics: Hazardous Emissions From Coal Combustion		Spring 1997: 8
• CCT NO <sub>x</sub> Controls Realize Commercial Acceptance		Winter 1997: 5
• Monitoring Effort Initiated Under PM <sub>2.5</sub> Program		Summer 1998: 8
• FE's Mercury Program – Quality Measurements and Cost-Effective Controls		Summer 2000: 8
• Regulatory Update		Summer 2000: 10
• PM <sub>2.5</sub> Monitoring Effort Advances		Fall 2000: 6
• NETL Fine Particulate Research		Fall 2000: 8
• FE Hosts Annual NO <sub>x</sub> Specialty Conferences		Fall 2000: 13
• DOE Stays Ahead of Mercury Regulation Momentum		Spring 2001: 5
• Sulfur Removal From Gasification-Derived Syngas		Summer 2001: 4
• Environmental Benefits Topical Report Published		Summer 2001: 6
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• Ongoing Research Updates PM <sub>2.5</sub> Source Fingerprints		Winter 2001: 6
• Clear Skies Initiative		Summer 2002: 8
• DOE Addresses Emerging Electric Utility Water Issues		Spring 2003: 8
• Energy & Environmental Research Center		Spring 2003: 10
• DOE Explores Externalities Cost		Spring 2003: 12
• Low-NO <sub>x</sub> Testing Produces Results		Summer 2003: 3
• DOE Mercury Control Progressing		Spring 2004: 3
• China Seeks U.S. De-NO <sub>x</sub> Technologies to Meet New Emission Regulations		Summer 2004: 8
• DOE Pursues Environmentally Friendly Zebra Mussel Control		Fall 2004: 4
• NETL Reviews Field Data on Mercury Speciation		Fall 2004: 6
• NETL Explores Mercury Measuring Techniques		Winter 2004: 4
• Thermoelectric Freshwater Needs		Winter 2004: 9
• NETL Assists in Measuring China's Mercury Emissions		Winter 2004: 12
• Low NO <sub>x</sub> from IGCC Turbines		Spring 2005: 9
• NO <sub>x</sub> Control Program Addresses Clean Air Interstate Rule (CAIR)		Summer 2005: 5
• New DOE Efforts on Power Plant Water Management		Winter 2005: 5



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— FOSSIL FUELS AND FUEL PROCESSING —		
— Coal —		
• NCC Touts Future Role of Coal		Summer/Fall 1997: 4
• United States Energy Association's Focus on Coal		Winter 1999: 6
• UCIG Meets to Evaluate Coal-Derived Fuels Research		Winter 1999: 9
• Latest EIA Coal Facts		Spring 2001: 11
• Long-Running University Coal Research Program Advances Science of Coal		Fall 2001: 9
• NAS Review Validates FE Research Efforts		Fall 2001: 10
• EPRI – Bringing Advanced Clean Coal Technology to Market		Spring 2002: 4
• Energy Bill Supports Coal		Fall 2005: 8
— Cofiring —		
• Coal Biomass Cofiring Effort Gains Momentum		Summer 1998: 4
• Biomass/Coal Cofiring Gains Favor Within Biomass Industry		Winter 1998: 7
• Results Successful from Treated-Wood/Coal Cofiring Tests		Spring 2000: 8
• Coal, Tires, and Sawdust Move Tri-Firing Concept Forward		Spring 2001: 12
• Biomass Cofiring Opportunities Awards		
— Gasification —		
• Opportunities for IGCC		Winter 1996: 9
• Role of Gasification for the 21 <sup>st</sup> Century (Institute of Gas Technology)		Spring 1999: 6
• FE Shares Gasification Technology Options with Japan		Spring 2000: 10
• IGCC Protocol with India Signed		Winter 2000: 10
• Sulfur Removal From Gasification-Derived Syngas		Summer 2001: 4
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• Laser Technology Has Potential to Enhance Gasifier Reliability		Fall 2001: 11
• Gasifier Testing at PSDF		Summer 2002: 1
• IGCC Briefings Completed Under U.S.–China Protocol		Fall/Winter 2002: 10
• Gasification Markets and Technologies Report		Fall/Winter 2002: 11
• NETL Completes a Successful PDU Test		Fall/Winter 2003: 11
• Hydrate Process to Capture and Sequester CO <sub>2</sub> from Coal Syngas		Fall 2004: 3
• Development of Transport Reactor Gasification at the PSDF		Winter 2004: 5
• Materials Research at Albany Research Center: Sensing Corrosion Present Under Ash Deposits, Improving Refractories for Coal Gasifiers		Spring 2005: 4

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**– Hydrogen –**

- |   |                     |
|---|---------------------|
| • DOE Offices Coordinating Hydrogen Activities                  | Summer 2001: 7      |
| • DOE Announces New Hydrogen-Sequestration Efforts              | Spring 2003: 2      |
| • New Zealand's National Hydrogen Workshop                      | Spring 2003: 7      |
| • DOE Highlights Growing Hydrogen Program                       | Fall/Winter 2003: 6 |
| • Coal-Based Hydrogen Coproduction with CO <sub>2</sub> Capture | Fall/Winter 2003: 7 |
| • DOE Announces New Hydrogen-Sequestration Efforts              | Spring 2003: 2      |
| • NRC Report Cites Prime Hydrogen Role for Coal                 | Spring 2004: 10     |
| • Computational Methods for Hydrogen Membranes                  | Spring 2005: 8      |

**– Ultra-Clean Transportation Fuels (UCTF) Program –**

- |  |                |
|--|----------------|
| • Clean Fuels Awards   | Fall 1998: 6   |
| • Coal-Derived Fuels and the Ultra-Clean Transportation Fuels Initiative | Summer 1999: 3 |
| • Fossil Energy's Transportation Fuels and Chemicals R&D Program         | Spring 2000: 4 |
| • Projects Advance Development of Ultra-Clean Transportation Fuels       | Spring 2001: 3 |

**– Other Fuels/By-Products –**

- |   |                 |
|---|-----------------|
| • Solid Fuels and Feedstocks Program Builds on Past Successes | Winter 1997: 7  |
| • By-Products Consortium Funds R&D Proposals                  | Winter 1999: 4  |
| • DOE Examines Environmental Issues in By-Product Use         | Spring 2002: 12 |
| • Promising Pilot Tests for CBM Technology                    | Summer 2003: 10 |
| • Coalbed Methane Forum Discusses DOE Resource Assessment     | Spring 2005: 11 |

**— INTERNATIONAL ACTIVITIES/INITIATIVES BY REGION —**

**GENERAL INTERNATIONAL**

- |  |                 |
|--|-----------------|
| • DOE Report to Congress: CCT Expressions of Interest in Foreign Countries                               | Summer 1995: 7  |
| • International CCT Finance Seminar  | Fall 1996: 7    |
| • World Bank's Clean Coal Initiative   | Spring 1997: 4  |
| • International News Bytes   | Spring 1998: 7  |
| • United Nations CCT Study Tour  | Summer 1998: 13 |
| • PCAST Supports International Energy Cooperation Programs   | Winter 1999: 10 |
| • Support for International Energy Cooperation Programs  | Winter 1999: 10 |
| • International CO <sub>2</sub> Ocean Sequestration Field Experiment: 2000 Oceanographic Research Cruise | Winter 2000: 11 |
| • Information Exchange Through ICCR  | Winter 2000: 12 |
| • DOE Fossil Energy International World Wide Web Site  | Spring 2001: 9  |
| • Interagency Group Drafting Plan for Clean Energy Technology Exports                                    | Summer 2001: 13 |

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• ICCR Meeting Discusses Member Energy Plans		Winter 2001: 8
• Sequestration Conference Reports on International CO <sub>2</sub> Capture Project		Summer 2004: 3
• NETL Hosts Foreign Service Officer Coal and Power Training		Fall 2004: 11
<b>AFRICA</b>		
• DOE Supporting South Africa Energy Initiatives		Summer 1998: 11
• South Africa Project Recognized for Contributing to GHG Reduction		Fall 1998: 9
• FE Assists South African Utility in Evaluating CCTs		Summer 2000: 11
<b>ASIA PACIFIC ECONOMIC COOPERATION</b>		
• FE Advocates CCTs Through APEC		Winter 1997: 10
• APEC's Focus on Coal		Winter 1998: 8
• APEC Coal Flow Seminar: A Tool for Regional Stability		Fall 2000: 11
• APEC Exports Group on Clean Fossil Energy		Summer 2001: 11
• New APEC Report on CO <sub>2</sub> Reduction Options		Winter 2001: 8
• FE Chairs APEC Expert's Group Meeting in Korea		Spring 2004: 9
• FE-Led APEC Group Holds Workshops in Korea and Philippines		Spring 2005: 12
<b>EAST ASIA &amp; PACIFIC</b>		
• U.S./Australia CCT Interests in Sync		Fall 1996: 4
• Fossil Energy Activity in China		Fall 1996: 5
• New China Laws to Reduce SO <sub>2</sub>		Fall 1996: 5
• New Chinese CCT Project		Spring 1997: 4
• DOE Sponsors CCT and Coal Utilization Workshop (Taiyaun, China)		Winter 1997: 9
• Korea Energy/Environment Workshop a Success		Winter 1997: 10
• U.S.-China Energy and Environmental Technology Center		Spring 1998: 6
• CCTs to be Evaluated for Philippines Palawan Province		Fall 1998: 9
• Pittsburgh Coal Conference — Panel Highlights Asia Energy Picture		Winter 1998: 5
• FE Supports Taiwan, China's CCT Projects		Winter 1998: 9
• First Annual Meeting of U.S.-China Energy and Environmental Technology Center		Summer 1999: 9
• U.S./Japan Workshop Highlights R&D Cooperation		Summer 1999: 9
• Kyoto Update: COP 5		Winter 1999: 9
• CoalTech '99 Conference in Jakarta, Indonesia		Winter 1999: 12
• FE Shares Gasification Technology Options with Japan		Spring 2000: 10
• U.S. and China Sign Technology Protocol		Summer 2000: 11
• Vietnam Emerging as a Global Coal Partner		Winter 2000: 11
• Two Major Conferences in China Under DOE-MOST Protocol		Spring 2001: 8

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• FE-NETL Provides Training for Indian Power Plant Managers (New Delhi, India)		Spring 2001: 9
• NETL to Support TCAPP Activities in China		Summer 2001: 13
• China Meetings Advance Fossil Bilateral R&D Efforts		Fall 2001: 1
• Albany Research Center Hosts Indonesian Engineers		Fall 2001: 13
• EETC Efforts for “Green” 2008 Beijing Olympics		Spring 2002: 9
• FE and Partners Explore Opportunities for CCTs in Thailand		Summer 2002: 11
• China EETC Workshop and Plant Tours		Fall/Winter 2002: 8
• IGCC Briefings Completed Under U.S.-China Protocol		Fall/Winter 2002: 10
• FE Assistant Secretary Mike Smith Visits China Spring		Spring 2003: 1
• New Zealand’s National Hydrogen Workshop		Spring 2003: 7
• NETL and Chinese Institute Cooperate on CO <sub>2</sub> Scrubbing Projects		Summer 2003: 13
• DOE and U.S.-China Conferences Focus on Coal		Fall/Winter 2003: 1
• FGD Training in China		Fall/Winter 2003: 9
• U.S.-China Coordination Continues		Spring 2004: 8
• FE Chairs APEC Expert’s Group Meeting in Korea		Spring 2004: 9
• China Seeks U.S. De-NO <sub>x</sub> Technologies to Meet New Emission Regulations		Summer 2004: 8
• China/U.S. Industrial Boiler Workshop a Major Success		Fall 2004: 10
• Sequestration Leadership Forum Meets in Australia		
• Japan’s Clean Coal Cycle (C3) Initiative		Winter 2004: 3
• Australian Coal: A Sustainable Future		Winter 2004: 8
• NETL Assists in Measuring China’s Mercury Emissions		Winter 2004: 12
• Japan’s Clean Coal Day		Winter 2004: 13
• FE Provides Technical Assistance Toward “Green” China Olympics		Spring 2005: 12
• FE-Led APEC Group Holds Workshops in Korea and Philippines		Spring 2005: 12
• DOE and China Negotiate New R&D Protocol		Summer 2005: 1

## EUROPE & EURASIA

• Polish Energy Experts Discuss Privatization (Fourth Annual CCT Conference)	Winter 1995: 7
• DOE Signs Fossil Energy Annex with Italy	Summer/Fall 1997: 10
• DOE-Ukraine Clean Coal Task Force	Summer/Fall 1997: 10
• Ukraine Conference Highlights Financial Recovery, Obstacles to Power Sector Development	Summer 1998: 12
• Multi-Fuel Reburning Holds Promise for Ukraine	Spring 1999: 8
• FE Outreach in Slovakia	Spring 1999: 9
• DOE Plays Major Role in Reducing Emissions in Krakow, Poland	Summer 1999: 8
• U.S./Turkey Conference Highlights Fossil Energy	Fall 1999: 6
• FE Visits Russia on Information Exchange Mission	Fall 1999: 7

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• Joint Statement Signed for Technical Cooperation to Strengthen Russian Coal Sector		<b>Winter 1999:</b> 11
• Triboelectrostatic Separation Applied to Slovakian Brown Coal		<b>Winter 1999:</b> 12
• U.S.-UK Collaboration in Clean Coal Technology		<b>Summer 2003:</b> 13
• FE-European Commission Meet to Discuss CO <sub>2</sub> Cooperation		<b>Summer 2004:</b> 9
• Cooperative Research with Norway		<b>Fall 2004:</b> 11
• CO <sub>2</sub> Sequestration Monitoring in Norway's North Sea		<b>Fall 2004:</b> 12
• U.S.-UK Workshop on Advanced Materials		<b>Summer 2005:</b> 12

## INTERNATIONAL ENERGY AGENCY

• FE Plays Key Role in WPF International Activities	<b>Summer 1996:</b> 7
• Fossil Energy Committed to International Energy Agency Goals	<b>Spring 1999:</b> 10
• New IEA Clean Coal Centre Study Areas	<b>Summer 2000:</b> 13
• IEA Group Drafts Fossil Fuels Zero Emissions Strategy	<b>Summer 2002:</b> 12
• IEA Committee Discusses Progress under Multiphase Flow Agreement	<b>Fall/Winter 2002:</b> 10
• U.S. and Canada Cooperate on Oxy-Combustion	<b>Fall 2005:</b> 9

## MIDDLE EAST

• U.S./Israel Technical Information Exchange	<b>Spring 1997:</b> 5
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## SOUTH & CENTRAL ASIA

• Clean Coal Goes to India	<b>Summer 1996:</b> 8
• FE to Co-Chair New U.S.-India Coal Advisory Group	<b>Winter 1996:</b> 4
• Clean Coal Technology Workshop in India	<b>Winter 1996:</b> 5
• U.S. AID Support in India	<b>Spring 1997:</b> 5
• India Coal Washing Plant Receives Accolades	<b>Summer/Fall 1997:</b> 11
• Recent FE Initiatives in India	<b>Fall 1999:</b> 7
• DOE Participates in International Conference in India	<b>Spring 2000:</b> 10
• Presidential Mission to India Unveils Energy Efficiency Initiatives	<b>Summer 2000:</b> 12
• India Greenhouse Gas Project to Include Regional Centres	<b>Fall 2000:</b> 10
• IGCC Protocol with India Signed	<b>Winter 2000:</b> 10
• FE-NETL Provides Training for Indian Power Plant Managers	<b>Spring 2001:</b> 9
• New Coal Ash Newsletter Launched in India	<b>Summer 2001:</b> 12
• NETL Supports Cooling Tower Efficiencies Training in India	<b>Fall 2001:</b> 12
• Engineers from India Trained in Utility Overhaul and Maintenance	<b>Spring 2002:</b> 8
• Meeting of Coal Advisory Group in Kolkata, India	<b>Summer 2002:</b> 12
• Climate Technology Award Goes to NETL Partner	<b>Fall/Winter 2002:</b> 9
• India and United States Continue Collaboration	<b>Fall/Winter 2003:</b> 9

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• NETL Helps India with Fly Ash Problem		Summer 2004: 9
• India Regulatory Workshop		Summer 2005: 12
• New Energy Dialogue Strengthens Indo-U.S. Ties		Fall 2005: 10
• Meeting of India-U.S. Coal Working Group		Winter 2005: 9

## WESTERN HEMISPHERE

• Clean Coal Outlook in Brazil	Spring 1996: 4
• DOE Supports Brazil's Quest for Coal	Summer/Fall 1997: 10
• TDA Joins DOE in Supporting Brazil's Quest For Clean Energy	Summer 1998: 12
• Mexico FBC Options	Spring 1999: 8
• FE Regulates Electricity Trade with Mexico and Canada	Winter 1999: 11
• U.S. and Canadian Cooperation on Carbon Sequestration Research	Fall 2001: 12
• U.S.-U.K. Workshop on Advanced Materials	Summer 2005: 12
• U.S. and Canada Cooperate on Oxy-Combustion	Fall 2005: 9

## — MATERIALS DEVELOPMENT —

• FE Carries Out Membrane Technology R&D	Winter 1999: 6
• Membrane Improvements Support Gas Separation	Winter 2001: 4
• High-Temperature Materials Testing Record at CERF	Spring 2002: 10
• Consortium Makes Progress on Materials Development	Spring 2004: 11
• Advances in Membrane Technology for Air Separation	Fall 2004: 7
• Materials Research at Albany Research Center	Spring 2005: 4
• U.S.-UK Workshop on Advanced Materials	Summer 2005: 12
• Materials Development for Ultra-Supercritical Boilers	Fall 2005: 6

## — POWER GENERATION —

### – Advanced Power Generation Systems –

• Power Systems Development Facility: The Focus of DOE	Summer/Fall 1997: 8
• Advanced Coal-Based Power and Environmental Systems '98 Conference	Fall 1998: 7
• Role of Gasification for the 21 <sup>st</sup> Century (Institute of Gas Technology)	Spring 1999: 6
• Power Systems Development Facility – Ensuring Clean Affordable Power for the 21 <sup>st</sup> Century	Fall 2000: 1
• Barge-Mounted PFBC	Fall 2000: 4
• ATS Program — A DOE Success Story	Fall 2000: 9
• Virtual Energy Plants of the Future	Summer 2001: 3
• Second Generation PFB Repowering Shows Promise	Fall 2001: 4
• Advances In Thermal Barrier Coatings	Fall 2001: 7



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• Laser Technology Has Potential to Enhance Gasifier Reliability		Fall 2001: 11
• DOE Developing Trapped Vortex Combustor Concept		Spring 2002: 6
• Gasifier Testing at PSDF		Summer 2002: 1
• Ramgen Demonstrating New Turbine Concept		Fall/Winter 2002: 3
• Gasification Markets and Technologies Report		Fall/Winter 2002: 11
• Interagency Group Fosters Turbine Technology		Fall/Winter 2002: 16
• Illinois Grants Permit to DOE-Funded LEBS Project		Spring 2003: 9
• Clean Energy Systems Meets Near-Zero Emissions Levels		Summer 2003: 6
• Zero Emissions Technologies: A New Initiative		Spring 2004: 1
• Virtual Reality to Improve New Power Plant Designs, Lower Costs		Summer 2004: 4
• Advances in Membrane Technology for Air Separation		Fall 2004: 7
• Development of Transport Reactor Gasification at the PSDF		Winter 2004: 5
• DOE-Stamet, Inc. High-Pressure Feeder Research Program		Summer 2005: 7
• Technology Development Through High-Performance Computing		Summer 2005: 10
• Materials Development for Ultra-Supercritical Boilers		Fall 2005: 6
• U.S. and Canada Cooperate on Oxy-Combustion		Fall 2005: 9
— Fuel Cells —		
• Fuel Cells — a Key to Vision 21		Summer 1999: 7
• SECA Seeks to Accelerate Fuel Cell Commercialization		Spring 2001: 10
• Kentucky Pioneer IGCC/Fuel Cell Project Underway		Spring 2003: 5
• SECA Core Technology Program Review Meeting		Fall/Winter 2003: 3
• World's Largest Clean Coal-Powered Fuel Cell		Fall 2004: 1
• New DOE Program to Advance Fuel Cell Central Power Stations		Fall 2005: 1
— FutureGen —		
• Materials Research at Albany Research Center: Sensing Corrosion Present Under Ash Deposits, Improving Refractories for Coal Gasifiers		Spring 2005: 4
• New DOE Program to Advance Fuel Cell Central Power Stations		Fall 2005: 1
• FutureGen Project Takes Shape		Winter 2005: 4
— Turbines —		
• Advanced Turbines — Building Blocks of Vision 21		Spring 1999: 2
• Ramgen Demonstrating New Turbine Concept		Fall/Winter 2002: 3
• Interagency Group Fosters Turbine Technology		Fall/Winter 2002: 16
• Low NO <sub>x</sub> from IGCC Turbines		Spring 2005: 9

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**– Vision 21 –**

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| • FE Unveils Vision 21 Concept for Closing Carbon Cycle  | <b>Summer/Fall 1997: 13</b> |
| • FE Organizes Separations Workshop for Vision 21 System | <b>Fall 1998: 12</b>        |
| • Advanced Turbines — Building Blocks of Vision 21       | <b>Spring 1999: 2</b>       |
| • Virtual Energy Plants of the Future                    | <b>Summer 2001: 3</b>       |
| • Membrane Improvements Support Gas Separation           | <b>Winter 2001: 4</b>       |
| • NETL Hosts Virtual Simulation Workshop                 | <b>Winter 2001: 10</b>      |

**— OTHER TOPICS —**

**– General National Laboratory News –**

- |  |                             |
|--|-----------------------------|
| • FETC Celebrates 50th Anniversary                           | <b>Summer 1998: 13</b>      |
| • Research & Development News                                | <b>Fall 1998: 10</b>        |
| • FETC's "In-House" R&D                                      | <b>Winter 1998: 1</b>       |
| • New National Laboratory Established                        | <b>Spring 2000: 5</b>       |
| • Albany Research Center Supports FE Mission                 | <b>Summer 2000: 4</b>       |
| • FE Hosts Foreign Service Officer Training Course           | <b>Fall 2000: 10</b>        |
| • Climate Technology Award Goes to NETL Partner              | <b>Fall/Winter 2002: 9</b>  |
| • NETL Completes a Successful PDU Test                       | <b>Fall/Winter 2003: 11</b> |
| • Minority Interns Undertake Coal Research                   | <b>Fall 2004: 9</b>         |
| • NETL Hosts Foreign Service Officer Coal and Power Training | <b>Fall 2004: 11</b>        |

**– Guest Articles –**

- |  |                            |
|--|----------------------------|
| • New Coal Stakeholder: Coal Utilization Research Council  | <b>Fall 1998: 8</b>        |
| • Role of Gasification for the 21st Century – Institute of Gas Technology  | <b>Spring 1999: 6</b>      |
| • Carbon Products Consortium Reviews Accomplishments and Future Research   | <b>Winter 2000: 4</b>      |
| • United States Energy Association's Focus on Coal   | <b>Spring 2000: 6</b>      |
| • Bringing Advanced Clean Coal Technology to Market – Electric Power Research Institute (EPRI)   | <b>Spring 2002: 4</b>      |
| • Energy & Environmental Research Center – EERC  | <b>Spring 2003: 10</b>     |
| • Coal-Based Hydrogen Coproduction with CO <sub>2</sub> Capture – National Fuel Cell Research Center/Advanced Power and Energy Program (NFCRC), University of California, Irvine | <b>Fall/Winter 2003: 7</b> |

**– In Memoriam and In Recognition –**

- |   |  |
|---|--|
| • In Memoriam: Co-Workers from METC; Co-Workers from PETC; Close Associates from the Industrial Community | <b>Special Memorial Issue, Fall 1994</b> |
| • Power Plant Hall of Fame  | <b>Summer 2000: 3</b>                    |

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<b>– Internet/Information Services –</b>		
• DOE TechLine Automated Fax Service		Winter 1991: 6
• FE International On-Line		Fall 1996: 6; Winter 1996: 5; Spring 1997: 6; Summer 1998: 9
• DOE Launches New Clean Coal Technology Web Site (CCT Compendium)		Spring 1998: 9; Fall 1999: 13
• Coal-Related Web Sites		Spring 2000: 11
• DOE Fossil Energy International World Wide Web Site		Spring 2001: 9
<b>– Legislative, Policy, and Regulatory Issues –</b>		
• Power Generation Competition Threatens Clean Coal (Fourth Annual CCT Conference)		Winter 1995: 9
• Domestic Regulatory Challenges (Fourth Annual CCT Conference)		Winter 1995: 11
• Fossil Energy Role in Deregulation		Fall 1999: 10
• National Energy Policy Highlights		Summer 2001: 2
• Gasification Technologies Workshop for Environmental Regulators		Summer 2001: 8
• Mercury/PM <sub>2.5</sub> Conference Addresses Regulatory and Technology Issues		Fall/Winter 2002: 13
• India Regulatory Workshop		Summer 2005: 12
• Energy Bill Supports Coal		Fall 2005: 8
• New U.S. Department of Energy Assistant Secretary (Jeffrey D. Jarrett) on Board		Winter 2005: 3
<b>– State and Regional Activities –</b>		
• North Dakota Clean Coal Activity		Spring 1997: 12
• Ohio Clean Coal Activity		Spring 1997/Fall 1999: 12
• SSEB Legislative Digest		Spring 1997: 13
• Mississippi Supporting Innovative Eco-Industrial Complex (Red Hills EcoPlex)		Summer/Fall 1997: 7; Fall 1999: 12
• North Dakota Funding CCT Activities		Summer/Fall 1997: 7
• Illinois Supporting LEBS Project		Fall 1999: 12
• National Conference of State Legislatures/Utility Restructuring		Fall 1999: 12
• Wisconsin Plan Emphasizes Fuel Diversity		Winter 2001: 12
• Ohio, A Partner in Clean Coal		Fall/Winter 2002: 6
• Coalbed Methane Forum Discusses DOE Resource Assessment		Spring 2005: 11